

Recommendations for:

Proposition 39: Clean Energy Jobs Act of 2012

Energy Efficiency K–12 Project Guidance

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Prepared at the request of the Administration by:

California Department of Education

California Energy Commission

California Public Utilities Commission



Subject to public input

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Background

The [California Clean Energy Jobs Act](#) (Proposition 39) was approved on November 6, 2012, by the voters of California. The initiative makes changes to corporate income taxes and provides for the annual transfer of funds from the General Fund to the Clean Energy Job Creation Fund for five fiscal years, beginning with the 2013–14 fiscal year.

The 2013–14 budget allocates \$464 million of Proposition 39 revenue to school districts, charter schools, county offices of education (collectively referred to as local educational agencies [LEAs]), and community colleges to support energy efficiency projects. In the four years to follow, LEAs and community colleges will receive an estimated \$550 million annually. Monies in the fund are available, upon appropriation by the Legislature, for purposes of funding eligible projects that create jobs in California while improving energy efficiency and expanding clean energy generation.

The California Department of Education (CDE) will be responsible for distributing funds to LEAs that serve grades K–12. These funds may be used by LEAs for energy efficiency and alternative energy projects, along with related improvements and repairs that contribute to reduced operating costs and improved health and safety conditions in public schools. Funds may also be used by LEAs for job training and workforce development in the energy efficiency and renewable energy industry sectors.

The CDE, in consultation with the California Energy Commission (CEC) and the California Public Utilities Commission (CPUC), developed this guidance to assist LEAs in prioritizing the use of funds and in planning and designing energy efficiency and workforce development projects that are cost-effective and create jobs, with total benefits that exceed project cost over time. Proposition 39 requires that projects be consistent with the state's energy loading order. The loading order guides the state's energy policies and decisions according to the following priority order: (1) decrease electricity demand by increasing energy efficiency and reducing energy usage during periods of high demand or cost; (2) meet new energy supply needs with renewable resources; and (3) meet new energy generation needs with clean fossil-fuel generation.

California's 10,000 public schools spend an estimated \$700 million per year on energy, which is equivalent to the amount spent cumulatively on books and supplies.¹ It is frequently the case that retrofit improvements to schools can save 20 to 30 percent of a school's energy bill, with a simple payback in the range of five to six years. If Proposition 39 funds can help achieve this, as much as \$140 million to \$200 million per year will be freed up from utility expenses to be deployed for other important school needs. For this reason, it is essential that LEAs invest the Proposition 39 funds wisely to obtain the expected project performance outcomes and reap long-term cash-flow gains for school operations.

As required by Proposition 39, all projects must be cost-effective, with total benefits exceeding project costs over time, and shall require contracts that identify the project specifications, costs, and projected energy savings. According to language in the Budget Act trailer bill, the funding provided in this program is subject to annual audits as

required by California Education Code (EC) Section 41020. LEAs will need to maintain documentation on project specifications and costs, which may also include technical assistance and projected energy savings, in order to complete the expenditure report that is due annually (on October 1) to the State Superintendent of Public Instruction (SSPI).

The appendix of this document includes a step-by-step checklist of actions recommended in this Guidance to ensure that LEAs prepare and execute projects that improve energy efficiency, expand clean energy generation, and create jobs in California.

Funding

Commencing with the 2013–14 fiscal year and concluding with the 2017–18 fiscal year, 89 percent of the funds deposited annually into the Clean Energy Job Creation Fund shall be provided to school districts, charter schools, and county offices of education by the SSPI on the basis of average daily attendance (ADA) reported as of the second principal apportionment for the prior fiscal year. No school district, charter school, or county office of education shall receive less than the applicable minimum award amount in any given fiscal year. The remaining 11 percent of funds shall be provided to community college districts by the Chancellor of the California Community Colleges on the basis of full-time equivalent students reported as of the second principal apportionment for the prior fiscal year.

According to the Governor’s proposal, based on estimated revenues of \$413 million in the first year of implementation, LEAs with 200 or fewer reported ADA will receive a funding award of \$15,000. LEAs with greater than 200 reported ADA will receive a funding award that is either (1) based on per ADA distribution, or (2) \$50,000, whichever is greater. The table below illustrates the number of LEAs in each range of ADA allocation for the 2013-2014 fiscal year.

Estimated Distribution, 2013–14

Range	Number of Local Educational Agencies
\$15,000	523
\$50,000	766
\$50,001–\$100,000	165
\$100,001–\$500,000	318
\$500,001–\$1,000,000	115
\$1,000,001–\$1,500,000	46
\$1,500,000–\$2,000,000	20
\$2,000,000–\$3,000,000	15
\$3,000,000–\$4,000,000	7
\$4,000,000–\$5,500,000	2
\$7,149,064	San Diego Unified
\$35,170,174	Los Angeles Unified

For the five-year program, each LEA is encouraged to develop a corresponding five-year plan. This can help integrate ADA allocation funds with other energy resources and funding during each fiscal year, including utility cost-sharing and various technical assistance resources. Refer to the “Related Resources” in the appendix for funding options.

Project Identification

This section provides guidance on what to consider when identifying and prioritizing energy improvements, including structural and safety considerations and compliance with accessibility standards.

A. Energy Efficiency Project Eligibility

Energy Efficiency Projects First

California's "loading order" of energy resources was first established in the 2003 California *Energy Action Plan*. This established a prioritization of energy strategies in response to the state's growing energy needs. Energy efficiency and demand response projects are addressed first, followed by renewable energy generation, distributed generation, combined heat and power applications, and clean and efficient fossil-fired generation.

Following this loading-order energy prioritization, LEAs should select energy efficiency and demand response projects first. Only after a facility has maximized its cost-effective energy efficiency options should funding for alternative energy generation projects (e.g., solar) be considered.

Outlined below is the hierarchy of project eligibility:

- I. First, maximize energy efficiency and/or peak demand reduction projects. Peak demand reduction, or "load management", aims to limit or shift electric demand away from high-cost, peak demand periods (e.g.; installing daylighting or energy management systems).
- II. Next, consider renewable on-site energy generation (e.g., solar, photovoltaic [PV] water heating, wind).
- III. Finally, consider non-renewable projects (e.g., efficient gas fuel cell or co-generation).

Whole-Building Approach for Maximizing Energy Efficiency

LEAs can achieve high levels of energy savings by taking a whole-building approach towards energy efficiency. Frequently, energy efficiency projects focus only on an isolated improvement (e.g., lighting or heating, ventilation, and air conditioning [HVAC] equipment). In general, these types of retrofits are simple and can be accomplished quickly, but they often overlook opportunities for greater energy cost savings. Evaluating energy efficiency from a whole-building or "integrated design" approach takes into consideration all of a building's energy systems and their interactions.

This approach should be considered when the overall building energy efficiency performance is poor or when multiple systems (e.g., lighting and HVAC equipment) are nearing the end of useful life. A good example of the importance of the whole-building approach can be seen in the interaction between the HVAC system and the building's doors, windows, and exterior walls - an energy-efficient central air conditioner should not be installed without first addressing issues with the building envelope (such as the building's leaky ceiling or wall insulation or duct work). Also, energy efficiency improvements to the building envelope or a reduction in plug-load demand could dramatically reduce a building's need for cooling, and thereby lower the capital, energy, and maintenance costs associated with an updated cooling system.

Eligibility Criteria

Proposition 39 establishes the following criteria for project eligibility:

- Projects must be cost-effective (please see definition under subsection D, "Project Cost-Effectiveness Criteria").
- Projects must focus on energy efficiency and demand reductions first.
- All projects shall require contracts that identify the project's specifications, costs, and project energy savings.
- Recipients agree to submit to financial audits, to make information such as facilities data available to program evaluators, and to provide information as required by the annual expenditure report.

Alternative energy generation projects and other innovative energy projects may be considered only if the LEA can document on their annual expenditure report that all other cost-effective energy efficiency projects are already installed or have committed installation contracts.

Energy Efficiency Project Examples

When planning for energy efficiency improvements in K–12 school buildings, it is important to think beyond the classrooms. Consider other school building areas such as the auditorium, multipurpose room, gymnasium, cafeteria, and kitchen. These areas may actually use more energy than classrooms due to the necessary equipment and usage periods. Other rooms with special purposes, such as the school office, library, media center, and computer and science labs, also offer great opportunities to save energy.

Numerous LEAs have identified Emergency Repair Program (ERP) projects that have not been undertaken because of a lack of funding. Many of these projects involve lighting or HVAC system upgrades that could result in significant energy savings. Any LEA that initiates Proposition 39 planning may elect to prioritize funding for all or a portion of ERP projects that result in energy efficiency.

Demand Response Projects

Occasionally, the demand for electricity is very high and the supply of electricity is not sufficient to meet it. Rather than build power plants that will be used only for a few hours each year, electric utility companies sometimes pay their customers to temporarily reduce electric demand. This is known as Demand Response (DR). Most utilities have DR programs in which LEAs can participate. In addition, private companies called Demand Response Aggregators will pay LEAs to reduce their electricity consumption during specified periods and sell the resulting load reductions to the utilities.

Climate Zone Recommendations

Energy use depends partly on climate conditions, which differ throughout the state. The California Energy Commission established 16 climate zones (CZ) that represent the geographic area of California. These specific climate zone distinctions help standardize the Title 24 Energy Efficiency Building Standards calculations. The climate zones are based on energy use, temperature, weather, and other factors. Some energy efficiency project recommendations are only cost-effective in specific climate zones. Therefore, it is important to know your climate zone. Below are two useful resources for determining a climate zone:

1) California Building Climate Zone Map:

http://www.energy.ca.gov/maps/renewable/building_climate_zones.html

2) List of climate zone areas by cities, towns, and other locations:

http://www.energy.ca.gov/maps/renewable/Climate_Zones_by_City.pdf

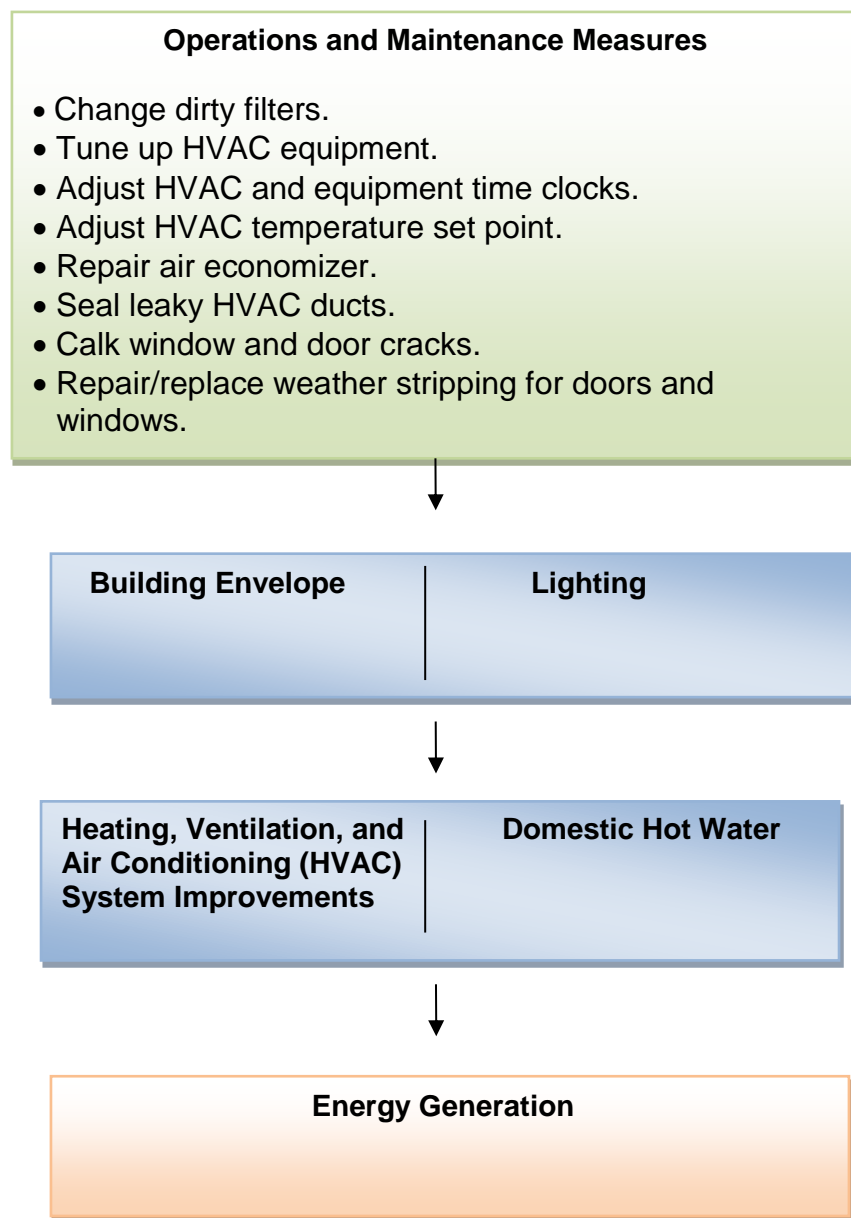
Hierarchy of Energy Project Evaluation

Increasing energy efficiency involves more than switching out light bulbs or replacing an old HVAC unit with a unit of the same size; it involves approaching your school as a complete system with air sealing, insulation, heating, air conditioning, water, and other systems working together more effectively to reduce energy use and lower your utility bills.

Therefore, a hierarchy or phased approach for reducing energy use is recommended when evaluating energy efficiency projects. This ensures that the interactive effects of all energy projects are considered and basic energy efficiency projects are identified first, before starting complex HVAC and energy generation projects.

The first step should identify all no-cost or low-cost projects that affect energy-using systems. Operations and maintenance (O&M) projects are the foundation for maximizing energy efficiency at any school. Changing dirty filters, weatherizing, and adjusting time clocks on HVAC equipment are just a few example O&M measures to consider.

Next, cost-effective lighting and building envelope projects need to be evaluated to further reduce the baseline energy use of the building. Finally, HVAC and domestic water-heating projects should be evaluated and properly sized to the new, reduced energy usage of the building.



Below is a list of typically cost-effective K–12 school energy efficiency projects. The list is broken down according to project categories, such as basic tasks, lighting, and so on. Within each category, the projects are ranked by priority order using a score of 1–5, with 1 being the most important and typically cost-effective and 5 being the least important for most schools. The priority rankings are based upon potential energy savings, cost, and practicality. It is strongly recommended that schools take on Priority 1 projects in each category, according to the hierarchy flowchart above, before moving on to Priority 2-5 projects. A project without a climate zone recommendation usually means it is appropriate for all climate zones. The appendix includes estimated construction costs for common energy efficiency upgrades.

Basic Tasks

Priority	Project Example	Climate Zone (CZ) Recommendations
1	Benchmark current energy usage.	
1	Conduct energy audits and surveys provided by investor-owned utilities (IOUs), public-owned utilities (POUs), California Energy Commission's Bright Schools Program, California Conservation Corps (CCC), and vendors.	

Lighting

Priority	Project Example	Climate Zone (CZ) Recommendations
1	Retrofit all existing T12 fluorescent fixtures with T8 lamps.	
1	Retrofit existing first-generation 32-watt T8 fixtures with 28-watt T8 lamps.	
1	De-lamp interior fluorescent fixtures (as appropriate).	
2	Replace incandescent lamps with screw-in compact fluorescent or light-emitting diode (LED) lamps.	
3	Replace standard high-bay metal-halide gymnasium fixtures with fluorescent T5 or T8 high-output (HO) fixtures.	
4	Replace exterior mercury-vapor lights with high-pressure sodium (HPS), metal halide, induction fixtures, or LEDs (bi-level if appropriate).	
4	Replace fluorescent or incandescent-based exit signs with LED exit signs.	
5	Replace high-intensity discharge (HID) lighting in parking lots with induction or LED lighting.	

Lighting Controls

Priority	Project Example	Climate Zone (CZ) Recommendations
1	Add occupancy sensor controls.	
1	Add photocell control to exterior lighting fixtures (bi-level if LED).	
2	Add daylighting controls when skylights are installed.	

Heating, Ventilation, and Air Conditioning (HVAC)

Priority	Project Example	Climate Zone (CZ) Recommendations
1	Conduct HVAC professional tune-ups, filter changes, and maintenance.	
1	Replace older (10 years or more) air conditioning/heat pump, split, or packaged systems with high-efficiency units (with higher Seasonal Energy Efficiency Ratio [SEER]/Energy Efficiency Ratio [EER]).	
1	Repair or install outside air economizers to reduce mechanical compressor cooling.	
2	Replace older (20 years or more) space-heating boilers with high-efficiency or condensing units.	Most beneficial for CZ1 and 16.
3	Replace older motors with new, premium-efficiency motors.	
4	Install variable frequency drives on air-handler fans, water pumps, and motors.	
4	Convert old multizone or dual-duct air handlers to variable air-volume systems.	Most beneficial to HVAC with simultaneous heating and cooling in CZ 9–15.
4	Install direct–indirect condenser cooling to increase SEER efficiency.	Most beneficial for CZs 9–15.
5	Evaluate ground-source heat pump to increase HVAC efficiency when conditions allow.	

HVAC Controls

Priority	Project Example	Climate Zone (CZ) Recommendations
1	Replace all manual thermostats with digitally controlled programmable thermostats that have override controls or twist timers.	
1	Install door switch controls to shut down (or set to minimum fan speed) HVAC units to prevent excessive cooling and heating when classroom doors are open.	
2	Evaluate network thermostat or energy management system (EMS) with override controls.	
3	Add CO ₂ -based demand-controlled ventilation (DCV) to large spaces with variable occupancy (e.g., multipurpose room, gymnasium, garage).	
5	Retrofit pneumatic controls with direct digital control (DDC).	

Water Heating

Priority	Project Example	Climate Zone (CZ) Recommendations
2	Replace older (15 years or more), storage-type water heaters with instantaneous (“tankless”) water heaters, hybrid pump units, or point-of-use units.	
3	Install condensing boiler or furnace when replacing old, inefficient units (15 years or older).	
4	Evaluate solar hot-water heating for pools.	
5	Separate domestic hot-water loop from space-heating loop.	

Building Envelope

Priority	Project Example	Climate Zone (CZ) Recommendations
1	Add ceiling or roof insulation if there is no insulation currently in place (consider spray polyurethane foam [SPF]).	
1	Apply new weather stripping to doors that are exposed to outside air.	

1	Install window film on south- and west-facing windows.	Most beneficial for CZs 9–15
1	When reroofing, evaluate the use of cool roof materials with high reflectivity and emissivity per the Cool Roof Rating Council.	Not cost-effective in CZ 1 and 16.
2	Install skylights or solar tubes — coordinated with lighting controls.	
3	Replace windows with Energy Star–rated products (If the replacement window is the same size, the project may be exempt from the Division of the State Architect review).	
4	Provide shading devices on south-facing windows.	Beneficial for CZs 9–15.

Water-Efficiency Measures

Priority	Project Example	Climate Zone (CZ) Recommendations
1	Install drip irrigation systems.	
2	Install low-flow plumbing fixtures.	
3	Plant native, drought-tolerant plants and landscaping.	

Kitchen Equipment

Priority	Project Example	Climate Zone (CZ) Recommendations
2	Install evaporator fan controllers at all walk-in coolers and freezers.	
3	Install low-flow, pre-rinse spray valves at dishwashing area.	
3	Evaluate energy-efficient kitchen appliances and technologies to reduce energy and water use.	

Pool Equipment

Priority	Project Example	Climate Zone (CZ) Recommendations
1	Install and use pool covers at night or when pool is not used.	

4	Evaluate variable speed drive for swimming-pool circulation pumps.	
4	Evaluate a pony pool pump for nighttime use.	

Other Equipment

Priority	Project Example	Climate Zone (CZ) Recommendations
1	Implement automatic shutdown software on all computers.	
1	Install occupancy controls on all vending machines.	

Miscellaneous

Priority	Project Example	Climate Zone (CZ) Recommendations
1	Conduct commissioning (the process of verifying and documenting that the building and energy systems perform interactively according to the design intent and the operational needs).	
1	Develop a training program for energy-efficiency maintenance.	
1	Provide energy-efficiency awareness courses/seminars for students, including behavior modification.	
2	Plant deciduous shade trees on south side of buildings.	Beneficial for CZs 9–15.

Demand Response (DR)

Priority	Project Example	Climate Zone (CZ) Recommendations
1	Sign up for an air conditioning cycling program, if available in your area.	Subject to available utility program incentive and rate schedule.
2	Sign up for another DR program (either through your utility or with a Demand Response Aggregator) to develop a load shed plan. This plan will involve reduced use of lighting, office equipment, kitchen equipment, elevators, and so forth during DR events by dimming, cycling, or turning off some or all	

	equipment.	
3	Install programmable communicating thermostats (PCTs) to help manage the air conditioning load; some utilities install these as part of their air conditioning cycling programs.	Subject to available utility program incentive and rate schedule.
4	To facilitate your ability to respond to DR events, install automatic controls such as energy management systems which reduce air conditioning load, lighting, or other equipment. Utilities offer rebates through their DR Technical Incentives and Auto DR programs that cover some of the costs of this equipment.	Beneficial for CZs 9–15 with buildings on real time pricing or time of use rates.
5	Evaluate thermal energy storage for shifting load away from peak hours.	Beneficial for CZs 9–15 with buildings on real time pricing or time of use rates.

Alternative Energy Project — Renewable Energy Generation

Priority	Project Example	Climate Zone (CZ) Recommendations
5	Evaluate solar energy generation.	Advisability depends on local solar access and energy costs.
5	Evaluate wind energy generation.	Only cost-effective for areas with wind potential.
5	Evaluate co-generation projects (combined heat and power projects).	

Health and Safety Conditions

Improve Indoor Air Quality

Priority	Project Example	Climate Zone (CZ) Recommendations
1	Waterproof building envelope (to prevent mold).	
1	Eliminate mold.	
1	Clean or replace HVAC filters as required by the equipment manufacturer; also ensure that ventilation system has good air flow, coils are clean, and air intakes are unobstructed.	Most beneficial for CZs 9–15 using air conditioning.

2	Purchase environmentally friendly cleaning products and art and science materials.	
2	Install or repair passive ventilation systems (operable windows).	
2	Purchase materials that emit low levels of volatile organic compounds (VOCs)—for example, paint and carpeting.	
2	Use Integrated Pest Management Practices (purchase less-toxic pest-control products).	
3	Install local exhaust fans where appropriate.	

Acoustics

Priority	Project Example	Climate Zone (CZ) Recommendations
1	Seal gaps in window frames and doors.	
1	Install dual-pane windows.	
2	Install acoustic ceiling tiles.	
4	Install acoustically treated curtains or drapes.	

Washrooms

Priority	Project Example	Climate Zone (CZ) Recommendations
3	Install sensor faucets, toilets, and dryers.	

B. Energy Efficiency Project Compliance Requirements — the Division of the State Architect (DSA)

To ensure that buildings are safe, the Division of the State Architect (DSA) must review and approve public school construction for compliance with the *California Code of Regulations*, Title 24, the California Building Code (CBC), when alterations or additions are made to existing buildings. The CBC specifies the following three triggers that require a structural building upgrade:

1. The alteration project cost exceeds 50 percent of building replacement value (excluding structural work).
2. The building seismic mass is increased by more than 10 percent.
3. The building seismic load capacity is reduced by more than 5 percent.

DSA review and approval is not required for alteration or reconstruction projects:

- With an estimated construction cost of \$39,324.38 or less (for 2013); or
- With an estimated construction cost of between \$39,324.38 and \$157,297.53 (for 2013), when certain conditions are met.

For more information, refer to the DSA Interpretation of Regulations Document IR A-10 at the following Web page: http://www.documents.dgs.ca.gov/dsa/pubs/IR_A-10_rev02-22-13.pdf.

In addition to these cost threshold exceptions, under the current California Administrative Code (CAC, Title 24, Part 1) and other CBC (Title 24, Part 2) provisions, certain energy conservation and efficiency projects may be exempted from DSA structural safety and fire and life safety review and approval. The following table lists potential project types and the related DSA requirements for review and approval of structural safety and fire and life safety.

Table 1: DSA Requirements for Structural, Fire, and Life Safety

No.	Project Type	DSA Structural Safety Review and Approval	
		Required?	Notes/References
1	Heating, ventilation, and air conditioning	No ⁱⁱ	HVAC unit replacement limited to units of equal or lesser weight, in the same location, and no structural framing is altered.
2	Reroofing with “cool” roof	No	Roof covering replacement and insulation limited to weight of existing roof covering and insulation.
3	Weatherization/caulking	No	
4a	Window replacement (glazing only)	No	
4b	Window replacement (frames and glazing)	Yes	DSA approval not required if entire window replacement project cost is \$39,324.38 or less per DSA IR A-10.
5a	Window shading devices—window screens (applied to glazing)	No	
5b	Window shading devices—solar shading devices requiring structural attachment	Yes	DSA approval not required if entire window shade structure project cost is \$39,324.38 or less per DSA IR A-10.
6	Energy Management Systems (EMS)	No	
7	Lighting upgrades—re-lamping, ballast replacements, fixture replacement	No	
8	Water-heating upgrades	No	
9	Skylights	Yes	DSA approval not required if entire skylight project cost is \$39,324.38 or less and no structural framing is altered.

See the Endnotes on page 56.

Accessibility Requirements for Energy Conservation and Efficiency Projects

The DSA must review and approve public school construction for compliance with accessibility standards given in the *California Code of Regulations*, Title 24, Part 2 (the CBC) when alterations or additions are made to existing buildings. If the existing “path of travel” elements do not comply with current code provisions, upgrades are required to the area of the work and designated elements serving the altered area. Upgrades to the current “path of travel” are required as follows:

- If the cost of the project is below \$139,934, then the cost of compliance is limited to 20 percent of the adjusted construction cost.
- If the cost is \$139,934 or higher, there is no limit to the cost of compliance unless the enforcing agency determines the cost of compliance is an unreasonable hardship.
- If unreasonable hardship is determined, there must be compliance by equivalent facilitation or to the greatest extent possible. However, the cost of compliance shall not be less than 20 percent of the adjusted construction cost.

Under the current proposed CBC accessibility provisions, certain energy conservation and efficiency projects may trigger accessibility upgrades outside the area of the project work. The following table lists potential project types and the related requirements for accessibility upgrades.

Table 2: DSA Requirements for Accessibility Upgrades

No.	Project Type	Path of Travel Access Upgrades	
		Required?	Applicable 2013 Code Sections
1	Heating, ventilation and air conditioning	No ⁱⁱⁱ	11B-202.4 Exceptions: 7
2	Reroofing with “cool” roof	No ⁱⁱⁱ	11B-202.4 Exceptions: 7
3	Weatherization/caulking	No ^{iv}	2-202 Definitions “Alterations” and 11B-202.4 Exceptions: 7
4a	Window replacement (glazing only)	No ^{iv}	2-202 Definitions “Alterations” and 11B-202.4 Exceptions: 7
4b	Window replacement (frames and glazing)	Yes ^v	2-202 Definitions “Alterations” and 11B-202.4
5a	Window shading devices—window screens (applied to glazing)	No ^{vi}	2-202 Definitions “Alterations” and 11B-202.4

No.	Project Type	Path of Travel Access Upgrades	
		Required?	Applicable 2013 Code Sections
5b	Window shading devices—solar shading devices requiring structural attachment	Yes ^{vii}	2-202 Definitions “Alterations” and 11B-202.4
6	Energy Management Systems (EMS)	No ^{viii}	2-202 Definitions “Alterations” and 11B-202.4 Exceptions: 7
7	Lighting upgrades—re-lamping, ballast replacements, fixture replacement	No ^{ix}	2-202 Definitions “Alterations” and 11B-202.4 Exceptions: 7
8	Water-heating upgrades	No ^x	2-202 Definitions “Alterations” and 11B-202.4 Exceptions: 7
9	Skylights	Yes ^{xi}	2-202 Definitions “Alterations” and 11B-202.4

See the Endnotes on page 56.

C. Project Identification and Prioritization Methodology

This subsection addresses the typical steps and information that LEAs should consider when identifying, comparing, and prioritizing potential projects. Proposition 39 allows for funding to be used to take these important steps. Additionally, the appendix includes an “Energy Efficiency Program Checklist” that summarizes these steps in an easy-to-use format.

Technical Assistance for Project Identification

Proposition 39 requires validation of cost-effective projects. Therefore, a contractor’s project identification cost and energy savings estimates need to be consistent.

Technical assistance can include any information activity that removes technical barriers and encourages LEAs to implement energy efficiency projects or provides information on other available utility or non-utility assistance.

Technical assistance for project identification can include activities that guide energy efficiency projects from identification and planning through implementation, using all types of available resources. Technical assistance includes the following activities:

- Benchmarking — provides information about a school’s energy usage. It can also be used to compare the energy performance of similar school buildings

- Scoping — a site/equipment energy survey, “investment-grade audits,” or no-touch audits with a baseline model and collection of whole-building data
- Investigation — review of energy conservation measures, project/improvement “design” (engineering specifications), and incentive application
- Procurement and construction management or implementation of project
- Verification — post-project monitoring

Energy Audit Guidelines

Energy audits vary in scope and depend on the configuration of a building’s energy systems, the project parameters set by the LEA (including the amount of its budget available for energy efficiency), and the scope and capabilities offered by the energy auditor. Because it usually is not possible to know where the audit process will lead and which level of effort will be most cost-effective, the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) has defined three progressive levels of audits. These audits, as well as “no-touch” audits and California Conservation Corps Energy Efficiency Opportunity Surveys, are described below:

- 1) **ASHRAE Level 1 Audit:** walk-through analysis/audit for small allocations of less than \$15,000

The Level 1 audit is a simple audit, screening audit, or walk-through audit. It involves interviews with site operating personnel, a review of facility utility bills and other operating data, and a walk-through of the facility, all geared toward the identification of glaring areas of energy waste or inefficiency. For LEAs receiving small allocations, this would be the appropriate level of project identification and analysis. The Level 1 audit is sufficient for lighting, lighting controls, and simple energy-efficiency retrofits.

- 2) **ASHRAE Level 2 Audit:** energy survey and analysis for larger allocations of \$15,000 or more

The Level 2 audit includes the preliminary ASHRAE Level 1 analysis, but also includes more detailed energy calculations and financial analysis of proposed energy efficiency measures. The financial analysis provides a comprehensive understanding of the financial benefits of implementing specific energy efficiency measures. The auditor collects and evaluates utility bills covering a period of 24 to 36 months, which allows for an assessment of the facility’s energy/demand rate structures and energy usage profiles. This type of audit identifies all appropriate

energy conservation measures based on the facility's operating parameters. A detailed financial analysis is performed for each measure based on implementation cost estimates, site-specific operating cost savings, and the investment criteria. Sufficient detail is provided to justify project implementation.

To conduct an effective ASHRAE Level 2 audit, follow the California Energy Commission's [Guide to Preparing Feasibility Studies for Energy Efficiency Projects](#) (publication number P400-00-002).

3) ASHRAE Level 3 Audit:

The ASHRAE Level 3 audit expands on the Level 2 audit by providing a “whole-building computer simulation,” whereby a computer program is used to generate an accurate model of the way a building would respond to changes in its energy systems, whether those changes are major HVAC retrofits or architectural modifications to walls, windows, and the roof. The ASHRAE Level 3 audit involves much more detailed data collection over the course of weeks or months. The building model is calibrated using actual utility data to provide a realistic baseline against which operating savings for proposed energy efficiency measures are computed.

4) Smart Meter–Based “No-Touch” Audit:

A “No-touch” audit and/or assessment utilizes hourly weather data, geographic information systems (GIS) building data, square footage, operating schedules, and occupancy type to conduct an audit remotely, which can reduce the amount of labor and travel time needed to conduct on-site audits and generate reports. Pricing schemes for these types of audits are not currently available, as the dashboards used in the audits are currently administered through proprietary software.

5) California Conservation Corps (CCC) Energy Efficiency Opportunity Survey:

The CCC provides a cost-effective Energy Efficiency Opportunity Survey that is equivalent to either the ASHRAE Level 1 or Level 2 energy audit, depending upon the requirements and anticipated scope of the energy efficiency project for each LEA. These Surveys are part of the CCC's ongoing workforce development programs and are conducted throughout California by young men and women and returning veterans under professional supervision provided by the CCC. All CCC Energy Efficiency Opportunity Surveys include expert third-party analysis of current energy efficiency and energy efficiency retrofit recommendations appropriate to the scale of the project, potential energy and cost savings, return on investment (ROI), and available funding levels.

D. Project Cost-Effectiveness Criteria

Proposition 39 requires that all energy projects be cost-effective, meaning that total benefits shall be greater than project costs over time. When determining project cost-effectiveness, benefits beyond energy savings can be included. For example, non-energy benefits, such as those pertaining to health and safety, can be considered when calculating the total project benefits.

Below are a few terms and approaches to consider:

1) How to define the “project”

Single measure: A single energy efficiency measure (e.g., replacing fluorescent lamps with LED lighting) that meets the cost-effectiveness criteria.

Bundled measures: A project that consists of a package of energy efficiency technologies. For example, a project may include replacement of lighting fixtures and lamps, additional lighting and space-conditioning controls, and the addition of solar light tubes in some classrooms.

Add-on or upgrade to a building renovation: In some cases, a school may have a major renovation already planned (e.g., to upgrade heating and cooling systems or replace plumbing fixtures in restrooms and showers). An eligible energy efficiency project might consist of incremental changes or higher-efficiency specifications that upgrade the renovation beyond the minimum building code or design requirements.

2) How to determine what is “cost-effective”

a. Perspective

Project costs and benefits should be identified from the perspective of the LEA. This means thinking in terms of cash outlays and savings, without using the broader economic perspective of an energy utility (the value of avoided energy supply) or society (e.g., the secondary benefits of savings that are re-spent in the California economy).

b. Costs

For a completely discretionary project, the “cost” is the total installed expense of the measure or project, such as hardware or equipment, materials, installation, engineering, or design.

In the case of a renovation that was already planned, the cost for the “energy improvement project” would be the incremental or upgrade costs (but not the basic costs).

c. Benefits

Energy Savings

- Savings are typically based on the estimated reduction in electricity and gas utility bills.
- In the case of a renovation that was already planned, the savings for the “energy improvement project” would be the estimated savings above and beyond the projected energy use for the minimum design of the basic project.

Non-Energy Benefits (NEBs)

Proposition 39 allows for non-energy benefits (NEBs) to be considered in determining cost-effectiveness, although it is often difficult to quantify NEBs or translate them into economic values (See “Energy Planning and Best Practices: Creating Healthy Learning Environments,” in the appendix.) From an LEA’s perspective, NEBs typically would include the following:

- Labor savings: reduced operations and maintenance costs from better-performing or longer-lasting energy systems (e.g., less time spent replacing burned-out lighting or maintaining the HVAC system)
- Water savings: reduced water usage or lower wastewater utility bills
- Health effects: improved indoor and campus air quality, which may improve student and teacher health and result in reduced absenteeism
- Comfort effects: better lighting, temperature, ventilation, noise reduction, or other factors which may affect student and teacher well-being, reduce absenteeism, and improve student performance
- Safety effects: decreased fire and combustion hazards; structural improvements to building; improved security resulting from better lighting
- Educational effects: student involvement with project can be an ongoing learning experience

Because quantifying NEBs is challenging, there are several options for including NEBs in a Proposition 39 cost-effectiveness framework:

- Quantify the easily estimated savings, such as reduced costs for operations and maintenance (labor, supplies), and include these as monetary “benefits.”
- Use either a standard “add-on,” such as assuming an additional 10 percent value for harder-to-quantify NEBs (this is a rule of thumb used in some energy evaluation practices), or take a qualitative approach and simply list the specific NEBs expected from the energy improvement project.

d. Time frame for analysis

In determining the total value of both energy and non-energy benefits, it is important to estimate the period of time over which the benefits are expected to continue. For example, lighting improvements should last 10 to 12 years. This is referred to as the “expected useful life” of the measures or the project. For bundled or more comprehensive projects that have measures with varying useful lives, an LEA can calculate a weighted life for the whole project. For example:

Item	Percentage of Project Cost	Expected Life
HVAC filters	5	2 years
High-efficiency fans	20	7 years
Lighting fixtures	25	15 years
Daylighting	50	30 years

Weighted life = 20.25 years ($.05 \times 2$ plus $.20 \times 7$ plus $.25 \times 15$ plus $.50 \times 30$)

e. Metrics for determining “cost-effectiveness”

Project cost-effectiveness typically will call upon one of three financial metrics, depending upon the size and complexity of the project. These metrics are described below:

Simple Payback

- Metric: The simple payback (in years) does not exceed the useful life of the proposed equipment.
- Divides the total cost of the project by the expected annual savings to indicate the number of years it will take for the investment to pay back the initial outlay (For example, spend \$50,000 and save \$10,000 per year for a five-year payback).

$$\text{Simple Payback (years)} = \frac{\text{Projected Cost (dollars)}}{\text{Anticipated Annual Energy Cost Savings (dollars per year)}}$$

- Example: New lighting fixtures will last 15 years. If the simple payback is five years, a five-year payback easily produces economic return within the expected 15-year life.
- The downside to this approach is that it does not compare the expected life cycle of alternative measures or projects that have different life expectancies. For example, if one project lasts only seven years, and another of equal cost and identical annual savings lasts 15 years but has the same “simple payback” of five years, the second project may be a better choice because it would produce savings for an additional eight years.

“Biggest Bang for the Buck”

This approach can be used when an energy audit or analysis suggests there are many potential improvements for a facility.

- Metric: Each measure could have a “cost of energy saved” metric, such as \$.03 per kWh saved, \$.05 per kWh saved, or \$.015 per kWh saved.
- Example: The measures could be ranked in terms of costs and benefits, with the LEA selecting the most efficient items in succession until the budget limit is reached.

Net Present Value (NPV)

This involves adding the total expected cost savings from each measure (or the bundled project) for the life of the project, subtracting any up-front capital costs or increased operating costs, and applying a discount rate to acknowledge that savings will occur in future dollars.

- This approach is helpful when comparing alternative projects with different cost and saving profiles that could be undertaken with a given investment budget. NPV enables the decision makers to select the project(s) that will produce the greatest total financial benefit.

Other considerations: Measures will vary in terms of their anticipated costs and savings, yet their combination in a bundled project may produce an overall set of

benefits that ensures the overall project is cost-effective. A whole-building approach may help to maximize savings and still be cost-effective.

Job Training and Workforce Development

According to the language in Proposition 39, Chapter 2, Clean Energy Job Creation Fund, Section 26205(3)(b), monies in the fund “shall be available for appropriation for the purpose of funding projects that create jobs in California improving energy efficiency and expanding clean energy generation, including job training and workforce development.”

LEAs are encouraged to achieve the maximum amount of job creation and energy benefits from projects that can be undertaken with available funds. In the process of achieving these primary purposes, some Proposition 39 funding also may be used to:

- Retain high school students by funding Green Partnership Academies that provide a career pathway to employment in the energy industry, postsecondary education and training, apprenticeship, and/or the California Conservation Corps (CCC) for hands-on training and work experience;
- Engage the CCC and Certified Community Conservation Corps to:
 1. Conduct Energy Efficiency Opportunity Surveys, which provide the baseline for Proposition 39 projects and ensure the participation of unemployed young adults and recently returned veterans;
 2. Perform small-scale energy efficiency projects; and
- Create opportunities for workers to enter the skilled trades by ensuring the participation of apprentices on energy efficiency projects funded by Proposition 39.

LEAs can also partner with community colleges for select school employees to receive training to upgrade their skills; this is to ensure that newly installed energy efficiency measures are maintained and commissioned and that procedures are in place to maximize the return on energy efficiency investments.

The text that follows provides an overview of California Partnership Academies, CCC energy program services for school districts, and apprenticeship programs offered through the California Department of Industrial Relations.

California Partnership Academies

In 1984, the Legislature wrote the California Partnership Academies (CPAs) into statute to motivate at-risk youths by making academic instruction relevant through career preparation and partnership with industry, which provides mentors, internships, and validation of career technical courses. CPAs proved capable of dramatically increasing

student retention and graduation rates and stimulating the state economy by preparing previously at-risk students for good-paying jobs in all industries—including clean, green, emergent technologies, renewable energy, manufacturing, construction, and transportation—to meet California’s need for those prepared to enter the skilled trades. Today there are approximately 500 CPAs, which enroll more than 58,000 students and have a senior graduation rate of 95 percent—10 percent higher than the state at large.

The CPAs are models for effectively integrating academic skills and career preparation. As defined by California *Education Code (EC)* sections 54690 to 54699, CPAs are designed to provide an introduction to capstone-level career skills and preparation and give students the opportunity to earn industry certifications, enter apprenticeship programs, or seamlessly matriculate into established postsecondary programs. The proposed programs have been developed, or will be newly funded, for the purpose of training students in clean and renewable energy and fuels; green building construction and retrofitting; environmental transportation and mass transit (including high-speed rail); design and manufacture of green technology or alternative energy sources; environmental stewardship and restoration; and waste management. Plans are already under way to develop a prototype matching CPAs with the National Building Trades Multi-Craft Core Curriculum as a capstone course/pre-apprenticeship, in collaboration with the California Labor Federation and several of California’s labor unions. Implementation is expected in the fall of 2013.

In addition to these projects and programs, CPA leadership has established significant partnerships with the California Energy Commission (CEC) and Pacific Gas and Electric Company (PG&E), and discussions about expanding these partnerships to include Southern California Edison, San Diego Gas and Electric, the California Public Utilities Commission, and the California High-Speed Rail Authority have begun. Each of these entities has seen the clear value of the stable, successful, established CPA model and its value to students, educators, and employers.

California has an opportunity to combine the education and training of its highly skilled technical workforce with its efforts to reduce high school dropout rates. Clean technology jobs and renewable energy jobs can provide underserved communities with pathways out of poverty, a new and inspiring focus for educational institutions, and significant statewide economic and environmental benefits. LEAs that would like to begin or continue participation in a Green Technology CPA may use their Proposition 39 funding allocation to pursue this type of project or program.

California Conservation Corps, Certified Community Conservation Corps, and YouthBuild

Established in 1976, the California Conservation Corps (CCC) is a state agency with 27 operational centers throughout California. Certified Community Conservation Corps share a similar mission with the CCC, but operate as independent, nonprofit organizations. There are 14 Certified Community Conservation Corps throughout the state.

Proposition 39 directs funding to the CCC, Certified Community Conservation Corps, YouthBuild, and other workforce development programs to train and employ disadvantaged youths, veterans, and others in the areas of energy efficiency and clean energy projects. The CCC and Certified Community Conservation Corps can utilize their existing statewide infrastructure and experience to put young men and women, including veterans, to work by assisting schools with energy efficiency and renewable energy projects. The CCC may perform the following services:

- 1) **Conduct energy surveys of school buildings**—crews are deployed to complete surveys at a cost ranging from 4 to 10 cents per square foot. CCC, in partnership with an energy efficiency firm, can produce a report from the survey that:
 - Provides baseline data;
 - Helps prioritize projects;
 - Determines return on energy efficiency investments.
- 2) **Install low-tech, low-cost measures** that would result in immediate energy savings.
- 3) **Implement a menu of low-cost energy efficiency options**, particularly for smaller school districts.
- 4) **Provide educational presentations** to students on ways to save energy.
- 5) **Install greening, shading, and cooling projects.**

LEAs that would like to engage the CCC in one or more of these projects may use their Proposition 39 funding allocation to pursue these efforts. By implementing these projects for school districts, the CCC provides hands-on, entry-level training and work experience as part of a comprehensive workforce development program for young

adults (ages eighteen to twenty-five) and recently returned veterans (up to age twenty-eight). Participants acquire the experience and training necessary to transition into employment, apprenticeship, and/or advanced training in the energy field at the end of their service with the CCC.

Apprenticeship Programs (California Department of Industrial Relations)

The Division of Apprenticeship Standards (DAS) at the California Department of Industrial Relations creates opportunities for Californians to gain employable lifetime skills and provides employers with a highly skilled and experienced workforce while strengthening California's economy.

Each year, the DAS awards completion certificates to graduates of the 611 currently active apprenticeship programs in more than 500 occupations. The first goal of DAS is to match the needs of workers, who are seeking the skills to get and keep a decent-paying job, with the needs of employers, who are seeking skilled workers. The second goal of DAS is to strengthen the apprenticeship alliance among industry, labor, education, and government for recruiting workers and teaching them desired skills for employment.

In January 2010, the California Apprenticeship Council (CAC) voted to require all crafts to add green components to their Minimum Industry Training Criteria (MITC). In October 2010, the CAC accepted MITC with green components for 23 trades, many with multiple occupations, particularly in construction and related crafts (e.g., electrical work).

For apprenticeship purposes, green construction is defined as work practices and job processes that include recycling and reuse of products; use of technologies, materials, and methods that reduce harm to the environment; and efforts to further energy efficiency, high-performance building, and preservation of natural resources. These are practices that are experienced in all trades, with each having its own technologies that the apprentice will learn for their chosen craft. While apprentices progress through their related and supplemental instruction, they become informed on environmental issues, are taught the importance of practicing green construction, and given an overview of these practices.

If Proposition 39 monies are to be spent to increase energy efficiency on "public buildings" such as schools, that work must comply with several statutes in the *Labor Code* dealing with payment of prevailing wages and apprenticeship. Prevailing wage requirements are referenced in the appendix. In addition, the awarding of contracts by public agencies (e.g., individual schools and school districts) must conform to statutes for fair contracting and fair competition set forth in the state's *Public Contract Code*.

Labor Code 1777.5 (o) requires the use of apprentices on public works jobs with total costs in excess of **\$30,000**: "This section [requiring the employment of apprentices] does not apply to contracts of general contractors or to contracts of specialty

contractors not bidding for work through a general (also known as ‘prime’) contractor when those contracts involve less than \$30,000.” It is worth noting that the \$30,000 threshold applies to subcontracts with the prime contractor—for example, a \$20,000 painting subcontract with a general contractor that has a \$100,000 contract with the public agency—even if the subcontract is for less than \$30,000. As long as the general contract exceeds \$30,000, apprenticeship requirements apply to smaller subcontracts. Depending on the terms of the project contract, the apprenticeship program *may* facilitate Proposition 39’s goals of helping disadvantaged, underserved communities and veterans by requiring some degree of hiring for a local project to come from these potential local workforce participants.

Tracking and Reporting

The Clean Energy Jobs Act of 2012 (Proposition 39) requires all approved projects to be cost-effective and have total benefits that exceed project costs over time. In addition, all projects require contracts that identify the project specifications, costs (including technical assistance), and projected energy savings. LEAs will need to maintain documentation in order to complete the expenditure report that is due annually (on October 1) to the SSPI. Moreover, all projects are subject to financial audit.

According to the 2013–14 Budget Act trailer bill, the SSPI compiles and transmits this information to the Citizens Oversight Board (Board) by November 1 of each year for review and evaluation. The Board annually reviews all expenditures from the Job Creation Fund and also commissions and reviews a selection of projects completed to assess the effectiveness of the expenditures in meeting the objectives of the California Clean Energy Jobs Act.

The CDE has created a template for LEAs to use for the expenditure report that is due on October 1; see Attachment A in the appendix.

Program Evaluation, Measurement, and Verification

Evaluation, Measurement, and Verification (EM&V) is a standard protocol when assessing the impact of an energy efficiency project. Evaluation helps determine whether the energy savings that were projected for an energy efficiency retrofit project were realized, and if installed energy conservation measures are performing after the project has been completed. EM&V will enable LEAs to assess the impact and effectiveness of retrofit activities related to Proposition 39 funds. LEAs should choose an EM&V approach that is practical for the nature and scope of a project and consider the personnel skills or software tools to support that approach. Additionally, LEAs may be able to take advantage of related utility, Energy Commission, and other sponsored programs that offer EM&V services to participating schools.

In order to obtain the necessary information to allow this type of analysis and reporting, data collection from a variety of sources is needed. This data collection will allow contractors, facility managers, and other school departments to track the performance of their buildings over time, and ultimately recognize when building systems are underperforming.

Both baseline data and project-level data are needed to perform energy monitoring activities. Baseline data is essential for benchmarking a school's energy usage. Once a baseline has been established for a school, various tools can be used to track the installation of an energy efficiency project. Below are the types of baseline and project-level data typically needed:

Table 3: Typically Required Baseline and Project-Level Data

Baseline Data	Tools	Source	Purpose
Historical energy usage (12 months)	Utility bill	School/LEA	Benchmarking
Weather data (based on address)	Utility bill	School/LEA	Understanding how the building operates in different climate zones
Occupancy data	School documents	Facility Manager	Benchmarking and modeling assumptions for energy savings
Operating hours	Energy Management System	Facility Manager	Benchmarking
Rates	Utility Bill	Utility	Discover the potential for switching to time-of-use rates
Square footage	Energy Star Portfolio Manager	Facility Manager	Benchmarking

Building age	Energy Star Portfolio Manager	Facility Manager	Benchmarking
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Formal evaluation of projects supported by Proposition 39 may be conducted by the Citizens Oversight Board, a Proposition 39 administering agency or utility, or CEC sponsors of complementary programs and financial incentives. This may require detailed baseline information regarding installed building systems (e.g., envelope, mechanical, lighting). Evaluators may collect measure-level data from a sampling of projects to validate energy savings through field investigation and other methods.

Table 4: Typically Required Measure-Level Data

Project Data	Tools	Source	Purpose
kWh	Modeling tools	Contractor	Energy Savings
kW	Modeling tools	Contractor	Peak Demand Savings
Dollars (\$)	Utility bill	School/Contractor	Bill Savings

California Conservation Corps Evaluation, Measurement, and Verification Resources and Services

In addition to the services described previously, the CCC can provide energy efficiency retrofit “post-install” verifications and other services related to EM&V. These cost-effective EM&V services and Energy Efficiency Opportunity Surveys are part of the CCC’s ongoing workforce development programs. They are implemented by young men and women and returning veterans throughout California under the supervision of the CCC’s professional staff.

Appendix

Proposition 39 — Energy Efficiency Program Checklist

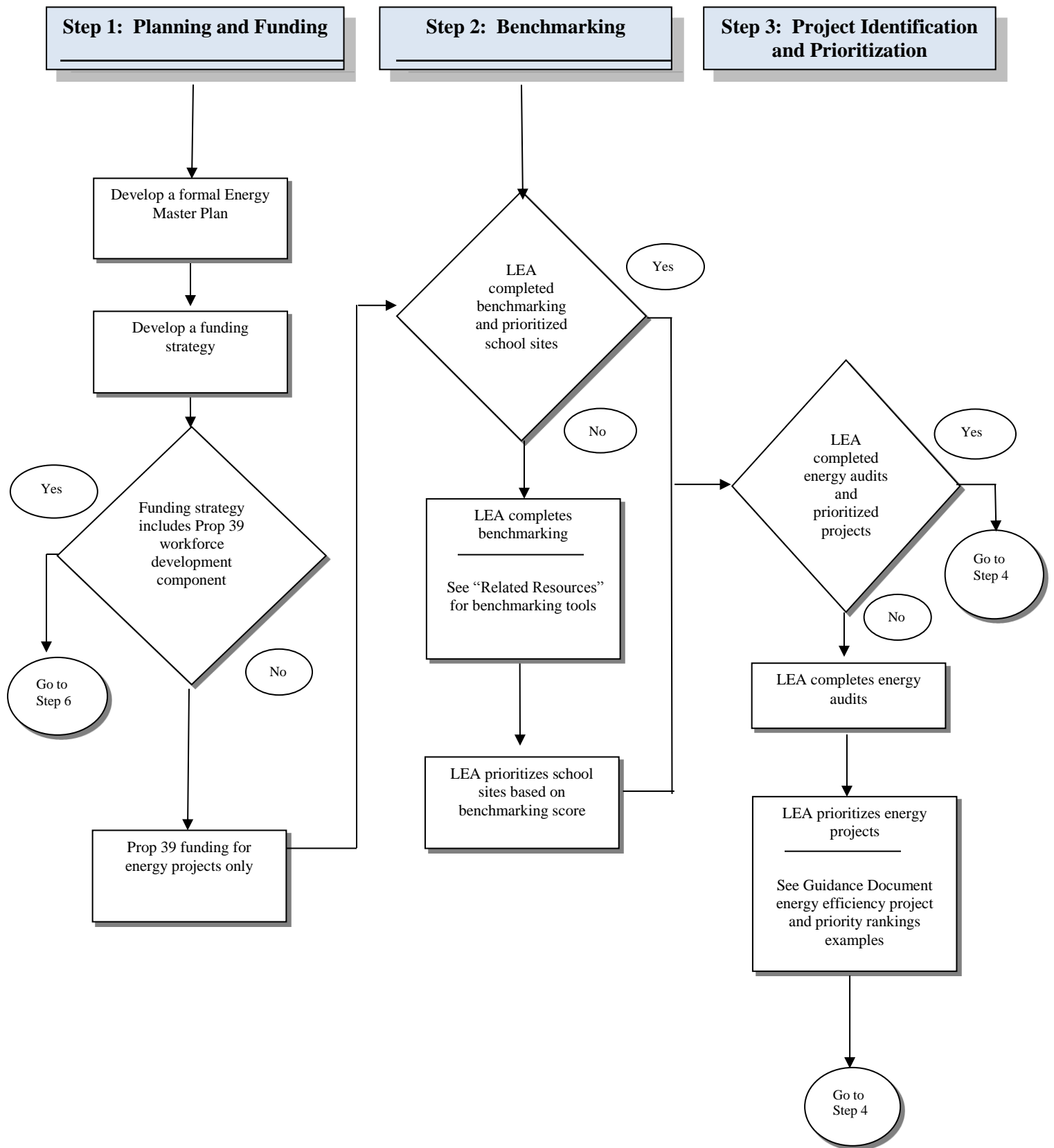
Step	Description
Step 1: Planning/Funding	Develop an estimated five year plan and project(s) budget. Explore additional funding sources.
a) Develop a formal energy master plan	<ol style="list-style-type: none"> 1) Identify energy goals 2) Identity steps for achievement 3) Define tasks and responsibilities 4) Monitor progress and adjust 5) Report results
b) Develop a funding strategy	<ol style="list-style-type: none"> 1) Consider Proposition 39 funding use options <ul style="list-style-type: none"> • Benchmarking • Technical Assistance • Energy Project Implementation • Workforce Development 2) Explore additional funding sources
Step 2: Benchmarking	Benchmark to determine how well individual schools in the district are performing in terms of energy efficiency.
a) Summarize Energy Data	Gather and summarize energy usage data for all fuels including electricity, natural gas, and fuel oil.
b) Establish an Energy Utilization Index	Establish an index to monitor energy utilization. For example, tracking energy dollars per square foot might be appropriate for your energy assessment needs.
c) Benchmarking Reports/School Ranking	Review the benchmarking report to be aware of how school facilities are sorted into rank order based on the energy utilization index.

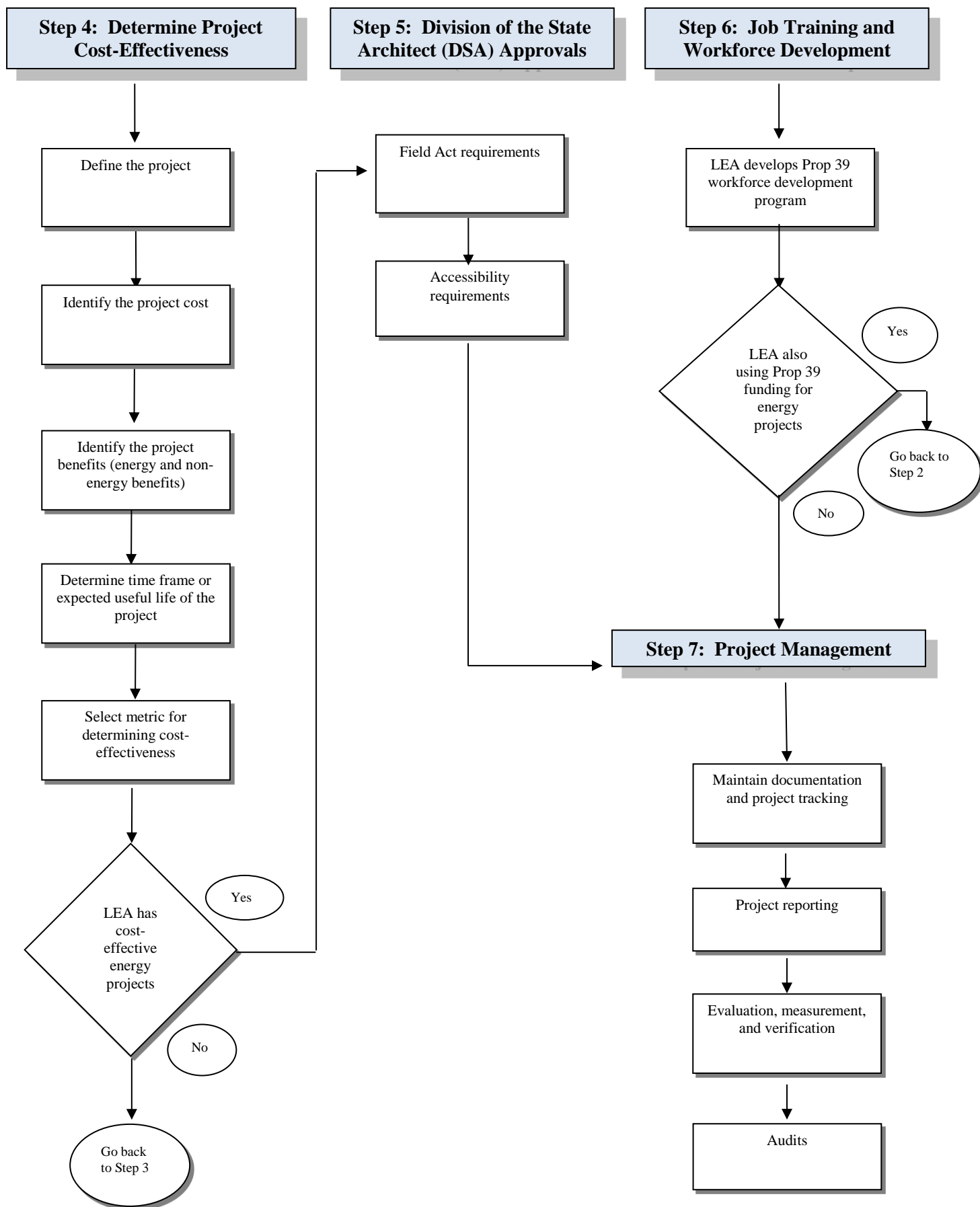
d) Identify the worst performers	<p>Consult the report ranking to determine the schools that consume the most energy when compared with others in the district.</p> <p>Resources: Beyond generating your own simple benchmarking metrics and reports, commercial benchmarking tools are available. Typically, these tools are computer programs (software) that require information about your facility, such as annual energy billing data. These programs are capable of more complex energy tracking and produce benchmarking reports with illustrated graphs and charts.</p> <p><i>For more information on benchmarking tools, see the “Related Resources” in this appendix.</i></p>
Step 3: Project Identification and Prioritization	For top-priority schools, the next step is to complete an energy audit to identify the cost-effective energy efficiency project opportunities.
Energy Efficiency Project Identification Checklist:	An energy audit is typically needed to identify technically viable and cost-effective energy efficiency and demand response projects that will reduce energy use and operating costs in your school.
a) Energy Audit	<p>i. ASHREA Level 1 Audit: If the LEA is receiving only a small allocation of Proposition 39 funding, a simple energy audit is sufficient.</p> <p>Conduct a Walk-Through Audit. This audit is the easiest and least expensive means of identifying and evaluating energy use in your school. It can identify the easy low- or no-cost energy improvements you can make in your school.</p>
	<p>ii. ASHREA Level 2 Audit: If the LEA is receiving a larger allocation of Proposition 39 funding, a comprehensive energy audit is suggested to identify energy efficiency projects.</p> <p>Complete a Comprehensive Study. This study analyzes all major energy-using systems and offers recommendations for operation and maintenance (O&M) improvements and cost-effective energy projects. A comprehensive study is a good choice for those who have implemented few or no</p>

	<p>energy-saving projects. The study serves as an energy management tool to assist in future facility planning decisions.</p> <p>Resources: Refer to the “Related Resources” in this appendix for more information on energy audits and project identification.</p>
b) Project Prioritization	Prioritize the opportunities to improve energy efficiency identified in the energy audit based on the LEA Energy Plan and/or energy project economic analysis.
Renewable Energy Generation Projects Checklist:	
a) Targeted Feasibility Study	Perform a Targeted Feasibility Study. This study analyzes only specific projects. A targeted study may be appropriate for those that have recently installed all energy-saving projects and who want to focus on areas not yet analyzed, such as renewable energy generation.
b) Project Prioritization	Prioritize the opportunities to improve energy efficiency identified in the energy audit based on the LEA Energy Plan and/or energy project economic analysis.
Step 4: Project Cost-Effectiveness	Determine the project’s cost-effectiveness by ensuring that the project adheres to the following criteria or contains the components noted below:
a) Define the project	<ol style="list-style-type: none"> 1) Single energy measure 2) Bundled energy measures (implementing two or more different measures under one project) 3) Add-on/upgrade
b) Identify project cost	The total installed cost of the project, such as hardware or equipment, materials, installation, engineering, or design.
c) Identify project benefits	<ol style="list-style-type: none"> 1) Energy savings 2) Non-energy benefits (NEBs) which may include: <ul style="list-style-type: none"> • Labor savings: reduced operations and

	<p>maintenance cost from better-performing or longer-lived energy systems.</p> <ul style="list-style-type: none"> • Health effects: indoor and campus air quality, which may improve student/teacher health and result in reduced absenteeism. • Comfort effects: better lighting, temperature, ventilation, noise reduction, and so forth may affect student and teacher well-being, reduce absenteeism, and improve student performance. • Safety effects: decreased fire and combustion hazards; structural improvements to building; improved security due to improved lighting, which could reduce property losses. • Educational effects: student involvement with project can be an ongoing learning experience.
d) Determine time frame or expected useful life	In determining the total value of the benefits, it is important to estimate the period of time over which the benefits are expected to continue.
e) Select metric for determining “cost-effectiveness”	<p>1) Simple payback does not exceed the useful life of the proposed equipment.</p> <p>2) “Biggest bang for the buck” approach is used when an energy audit or analysis suggests there are many improvements possible for a facility.</p> <p>3) Net present value adds the lifetime expected costs savings from each measure or the bundled project, subtracts any up-front capital costs or increased operating costs, and applies a discount rate to acknowledge that savings will occur in future dollars.</p>
f) Time frame for analysis of benefits	Estimate the period of time over which the benefits are expected to continue—both energy and non-energy.

Step 5: Division of the State Architect (DSA) Approvals	Review and approval by the DSA may be required for compliance with various building codes.
1) Field Act Requirements	Comply with the <i>California Code of Regulations</i> , Title 24, when alterations or additions are made to existing buildings to ensure that buildings are safe.
2) Accessibility Requirements	Comply with accessibility standards given in the <i>California Code of Regulations</i> , Title 24, when alterations or additions are made to existing buildings.
Step 6: Job training and workforce development	<p>Proposition 39 funds may be used on projects that create jobs in California to improve energy efficiency and expand clean energy generation. Below are noted entities wherein such jobs could be created:</p> <ol style="list-style-type: none"> 1) California Partnership Academies 2) California Conservation Corps 3) Certified Community Conservation Corps 4) YouthBuild 5) Division of Apprenticeship Standards—Green Skills
Step 7: Project Management	<p>Complete the annual report due on October 1 to the State Superintendent of Public Instruction. (Report template is Attachment A in the appendix of this document).</p> <ol style="list-style-type: none"> 1) Maintain documentation. 2) Track the project. 3) Submit project report. 4) Evaluate, measure, and verify the project's success. 5) Remember that all projects are subject to audit.





Range of Costs for Common Energy Efficiency Upgrades Rough Order of Magnitude Construction Costs

Pricing based on gross square footage

Pricing includes general contractor supervision and mark-ups

Pricing based on construction hard costs only—soft costs and permit fees are excluded

					Example: Average Cost Applied to ONE 26,000 GSF Building or 20 (1,000 sq. ft) Classrooms	
Common Energy Efficiency Upgrades — Prioritized		Low Per GS/F*	Average Per GS/F	High Per GS/F*	26,000 GSF Schl Bld	# (1,000 sq. ft) Classrooms or GSF
1	Retrofit lighting controls Provide occupancy sensors/photocells	\$ 2.43	\$ 3.04	\$ 3.64	\$ 60,700	20
2	Upgrade existing light fixtures Assumes one fixture/80 SF of classroom	\$ 4.86	\$ 6.07	\$ 7.28	\$ 121,400	20
3	Retrofit existing HVAC controls Assumes one 3-ton heat pump per 1,000 SF classroom	\$ 1.34	\$ 1.51	\$ 1.68	\$ 39,260	26,000
4	Upgrade existing HVAC distribution Retro-commissioning, duct/pipe insulation, test, and balance	\$ 5.55	\$ 11.10	\$ 16.65	\$ 288,600	26,000
5	Replace existing rooftop HVAC units Assumes 3-ton load per 1,000 SF classroom; re-use existing curbs	\$ 11.66	\$ 13.12	\$ 14.57	\$ 262,300	20
6	Replace HVAC systems in total	\$ 16.65	\$ 24.98	\$ 33.30	\$ 649,350	26,000
7	Replace roofing and roof insulation Assumes single-story classroom buildings	\$ 11.10	\$ 12.49	\$ 13.88	\$ 324,740	26,000
8	Daylight Harvesting Assumes 2 solar tubes per 1,000 SF classroom	\$ 5.55	\$ 6.25	\$ 6.94	\$ 124,900	20
9	Insulate exterior walls Assumes 900 SF of wall per 1,000 SF classroom	\$ 29.97	\$ 33.72	\$ 37.46	\$ 674,300	20
10	Replace existing perimeter glazing Assumes 300 SF of window per 1,000 SF classroom	\$ 24.98	\$ 31.22	\$ 37.46	\$ 624,400	20
11	Solar hot water for school domestic needs	\$ 16.65	\$ 18.73	\$ 20.81	\$ 486,980	26,000
12	Solar-power photovoltaic sufficient for net-zero cooling, lighting, and plug loads	\$ 36.08	\$ 45.10	\$ 54.11	\$ 1,172,470	26,000

* Costs provided for use in Prop 39 planning by a DSA Advisory Board construction firm member 4/2013

Related Resources

Benchmarking Tools

1. **Energy Star—Portfolio Manager (USEPA):** An online program that rates energy performance on a scale of 1–100 relative to similar facilities nationwide.
http://www.energystar.gov/index.cfm?c=k12_schools.bus_schoolsk12
2. **Operations Report Card (Collaborative for High Performance Schools [CHPS]):** An online tool that helps school building owners and operators benchmark the performance of existing schools and provides a report card of results, including suggestions for improvements. <http://www.chps.net/dev/Drupal/orc>
3. **Energy Challenger (San Diego Gas and Electric):** An online survey designed to help find ways to improve energy management. <http://regarchive.sdge.com/business/rebatesincentives/programs/energyChallenger.shtml>
4. **EnergyIQ:** An action-oriented benchmarking tool for non-residential buildings. It provides a deeper level of analysis that complements the Energy Star Portfolio Manager. <http://energyiq.lbl.gov/>
5. **Energy Design Resources:** Sponsored by the Investor-Owned Utilities (IOUs), provides decision-making tools for architects, engineers, lighting designers, and developers.
<http://www.energydesignresources.com/buildings/schools.aspx>

Commissioning Tools

1. **California Commissioning Collaborative:** A group of government, utility, and building-services professionals committed to developing and promoting commissioning practices in California. <http://www.cacx.org/>
2. **Commissioning Assistant:** A Web-based reference designed to provide project-specific commissioning information to the design team. <http://www.energydesignresources.com/resources/software-tools/commissioning-assistant.aspx>
3. **Energy Savings Calculation Tools and Data Analysis Tools:** Microsoft Excel workbooks and training documents for building commissioning measures and the retro-commissioning process.
http://www.cacx.org/resources/rcxtools/spreadsheet_tools.html#energy_savings_calulation_tools

Energy Audits — Project Identification

1. **ASHRAE Level 1 Audit: Walk-Through Analysis/Audit** (Small allocations, \$10,000 or less)
 - a. The Level 1 Audit is a simple audit, screening audit, or walk-through audit. It involves interviews with site operating personnel, a review of facility utility bills and other operating data, and a walk-through of the facility, all geared toward the identification of glaring areas of energy waste or inefficiency.
<https://www.ashrae.org/resources--publications/bookstore/procedures-for-commercial-building-energy-audits>
2. **ASHRAE Level 2 Audit: Energy Survey and Analysis** (Larger allocations, more than \$10,000):
 - a. The Level 2 Audit includes the preliminary ASHRAE Level 1 analysis, but also includes more detailed energy calculations and financial analysis of proposed energy efficiency measures. The financial analysis provides a comprehensive understanding of the financial benefits of implementing specific energy efficiency measures. The energy auditor collects and evaluates utility bills covering a period of 24 to 36 months, which allows for an assessment of the facility's energy/demand rate structures and energy usage profiles.

- b. The California Energy Commission's [*Guide to Preparing Feasibility Studies for Energy Efficiency Projects*](#) (publication number P400-00-002) provides a quality ASHRAE Level 2 audit.
3. **California Conservation Corps (CCC) Energy Efficiency Opportunity Survey:** A cost-effective energy survey that is equivalent to an ASHRAE Level 1 or Level 2 energy audit. CCC members perform the field work in partnership with third-party energy efficiency firms which analyze data and produce retrofit recommendations appropriate to the scale of the project, potential energy and cost savings, return on investment (ROI), and available funding levels. For additional information, visit <http://www.ccc.ca.gov>, call 916-341-3144, or contact Patrick.Couch@ccc.ca.gov.
4. **California Energy Commission Bright Schools Program:** Provides comprehensive energy audits to K–12 schools at no cost. For additional information, call 916-654-4104 or visit <http://www.energy.ca.gov/efficiency/brightschoools/index.html>.
5. **Investor-Owned Utility (IOU) Energy Audit Programs:**
 - a. **Pacific Gas and Electric Company (PG&E) Business Energy Checkup:** A do-it-yourself energy assessment. Visit <http://www.pge.com/en/mybusiness/account/diy/businesscheckup.page> or call 1-800-468-4743.
 - b. **Southern California Edison (SCE) Business Energy Advisor:** <http://tinyurl.com/brmnrhx>
 - c. **San Diego Gas and Electric (SDG&E) Energy Challenger:** See “Benchmarking Tools” on previous page.
 - d. **Southern California Gas (SoCalGas) Customer Service Advisor Walk-throughs:** Information is available by calling 1-800-GAS-2000. <http://socalgas.com/index.shtml>

See “Funding Resources” for information on utility rebate programs.

6. **Sacramento Municipal Utility District (SMUD) Commercial Energy Calculator:** A screening tool designed to calculate energy consumption and model single-building/single-use facilities. This tool will estimate electric and fuel usage and potential areas for savings in SMUD territories. <http://c04.apogee.net/calcs/comcalc/Profile.aspx?utilid=smud>
7. **Smart Meter–based “no-touch” audits:** “No-touch” audits and/or assessments utilize hourly weather data, GIS building data, square footage, operating schedules, and occupancy type and can reduce the amount of labor and travel time needed to conduct on-site audits and generate reports. Pricing schemes for these types of audits are not currently available, as the dashboards used in the audits are currently administered through proprietary software.

Energy Data

1. **Top Energy Efficiency Measures for Schools (PG&E):** Recommends the best energy efficiency measures to consider in a whole-building approach. http://www.pge.com/includes/docs/pdfs/mybusiness/energysavingsrebates/incentivesbyindustry/schoolsandcolleges/ctm-1209-0306_top6.pdf
2. **Energy Solutions for Schools (PG&E):** An introduction to school energy usage and energy management services available to schools. http://www.pge.com/includes/docs/pdfs/mybusiness/energysavingsrebates/incentivesbyindustry/schoolsandcolleges/ctm-1009-0125_schools.pdf

Energy Planning and Best Practices

1. **Advanced Energy Retrofit Guide: Practical Ways to Improve Energy Performance, K–12:**
This guide was commissioned by the U.S. Department of Energy (DOE) and presents general project planning guidance as well as more detailed descriptions and financial payback metrics for the most important and relevant energy efficiency measures (EEMs). It offers a practical roadmap for effectively planning and implementing performance improvements in existing buildings. <http://www.nrel.gov/docs/fy13osti/51325.pdf>
2. **Planning for Energy Efficiency (2009) (Coalition for Adequate School Housing [CASH]):**
Discusses school energy usage, project identification with a rating system, benchmarking, sample Energy Master Plan templates, and useful Web sites and resources. <http://www.cashnet.org/EnergyBrochure09.pdf>
3. **The Division of the State Architect's (DSA) Sustainable Schools:**
<http://www.sustainableschools.dgs.ca.gov/SustainableSchools/sustainabledesign/energy/energy.html>
4. **Best Practices Manuals - Collaborative for High Performance Schools (CHPS):**
CHPS has developed best practices manuals to help schools, districts and practitioners to achieve high performance design, construction, and operation. Although these target more than energy efficiency, there is much valuable energy efficiency information included.
<http://www.chps.net/dev/Drupal/node/288>
5. **Best Practices for Commissioning both New Construction & Existing Buildings:**
<http://www.bcxa.org/wp-content/pdf/BCA-Best-Practices-Commissioning-Existing-Construction.pdf>
<http://www.bcxa.org/wp-content/pdf/BCA-Best-Practices-Commissioning-New-Construction.pdf>
6. **Creating Healthy Learning Environments:** The following links provide guidance and information on healthy learning environments, including green purchasing, mold prevention, asthma management, radon, pesticides, and indoor air quality. Also included are assessment tools such as the Healthy School Environments Assessment and Healthy Seat to help school districts evaluate and manage their school facilities for key environmental, safety, and health issues.
 - a. **The Healthy Schools Act — Frequently Asked Questions:**
The Healthy Schools Act of 2000 put into place right-to-know requirements such as notification, posting, and recordkeeping of pesticides used at public schools.
http://apps.cdpr.ca.gov/schoolipm/overview/hsa_faq_color.pdf
 - b. **Healthy School Environments Assessment Tool (Healthy SEAT):** A unique software tool to help school districts manage their school facilities for key environmental, safety, and health issues.
<http://www.epa.gov/schools/healthyseat/basicinformation.html>
 - c. **Hazardous Waste Self-Inspection Checklist for Schools: Center for Disease Control and Prevention:** This checklist covers regulations issued by the US EPA regarding the generation, management, and disposal of hazardous wastes. <http://www.cdc.gov/niosh/docs/2004-101/chklists/n41was-1.htm>
 - d. **Integrated Pest Management in Schools:** Protecting children in schools from pests and pesticides.
<http://www.epa.gov/pesticides/ipm/index.htm>
 - e. **Radon, EPA:** An odorless, tasteless, and invisible gas produced by the decay of naturally occurring uranium in soil and water. <http://www.epa.gov/radon/aboutus.html>
 - f. **Mercury, Healthy School Environments EPA:** Mercury is used in many items in schools, such as thermometers, barometers, switches, thermostats, flowmeters, lamps, shows, and laboratory reagents in the science department. Accidental exposures to mercury can have a number of negative effects on children's health. http://cfpub.epa.gov/schools/top_sub.cfm?t_id=41&s_id=30

- g. **Safe Chemical Management in Schools, Healthy School Environments EPA:**
<http://www.epa.gov/schools/chemicals.html>
 - h. **Managing Asthma in the School Environment, EPA:**
<http://www.epa.gov/iaq/schools/managingasthma.html>
 - i. **Mold Remediation in Schools and Commercial Buildings, EPA:** The key to mold control is moisture control. Solve moisture problems before they become mold problems.
<http://www.epa.gov/mold/prevention.html>
 - j. **Cleaning for Asthma-Safe Schools (CLASS):**
<http://www.cdph.ca.gov/programs/ohsep/pages/class.aspx>
 - k. **Buying Green:** California's Guide for Sustainable Purchasing. <http://www.dgs.ca.gov/buyinggreen>
 - l. **Environmentally Preferable Purchasing (EPP) and Green Purchasing:** Green School Initiative.
<http://greenschools.net/article.php?id=43>
 - m. **Design for the Environment, an EPA Partnership Program: Frequently Asked Questions.**
<http://www.epa.gov/dfe/faqs.html>
 - n. **Vision for California Public Schools, California Department of Education:**
<http://www.cde.ca.gov/ls/fa/re/documents/vision.pdf>
 - o. **School Facilities Improve Learning, California Department of Education:**
<http://www.cde.ca.gov/ls/fa/re/documents/learnercenter.pdf>
 - p. **Safe Schools Foster Improved Student Learning, California Department of Education:**
<http://www.cde.ca.gov/ls/fa/re/documents/safeschools.pdf>
 - q. **Sustainable Schools Improve Learning and the Environment, California Department of Education:** <http://www.cde.ca.gov/ls/fa/re/documents/sustainable.pdf>
 - r. **Schools as Centers of Community Improve Learning, California Department of Education:**
<http://www.cde.ca.gov/ls/fa/re/documents/centersofcommunity.pdf>
 - s. **Fostering Learning in Healthy Indoor Environments:**
http://centerforgreenschools.org/Libraries/Resources_Documents/IAQ_Case_Study.sflb.ashx
 - t. **Curriculum Driven Design, Harnessing Green Buildings as Teaching Tools:**
http://centerforgreenschools.org/Libraries/Resources_Documents/Curriculum_Case_Study.sflb.ashx
7. **Improving Water Quality:** The following links provide assistance with water quality in educational facilities, water efficiency, childhood lead poisoning prevention, and schoolyard habitats.
- a. **Saving Water in Educational Facilities:** EPA Water Sense Fact Sheet.
http://www.epa.gov/watersense/commercial/docs/factsheets/education_fact_sheet_508.pdf
 - b. **Outdoor Water Use in the United States:** EPA Water Sense Fact Sheet.
http://www.epa.gov/WaterSense/docs/ws_outdoor508.pdf
 - c. **Water: School & Child Care Facilities:** EPA Information about drinking water quality.
<http://water.epa.gov/infrastructure/drinkingwater/schools/basicinformation.cfm>
 - d. **Schoolyard Habitat Program:** Stewardship through action helps teachers and students create wildlife habitat on school grounds. <http://www.fws.gov/chesapeakebay/schoolyard.htm>

- e. **Childhood Lead Poisoning Prevention: California Department of Public Health:**
<http://www.cdph.ca.gov/programs/CLPPB/Pages/AboutCLPPB.aspx>
- 8. **Waste Reduction:** The following link provides resources for school waste reduction including recycling, composting, and hands-on learning experiences for students.
<http://www.calrecycle.ca.gov/ReduceWaste/Schools/>

Energy Management and Project Implementation

- 1. **RFPs for successful state programs or facility owners:** Includes information to pre-qualify Energy Service Companies (ESCOs), pre-approved contracts, & project oversight agreement, and selection of an ESCO for a specific project. <http://www.energyservicescoalition.org/resources/model/index.html>
- 2. **Energy Savings Performance Contracting:** Energy Savings Performance Contracting (ESPC) is a method for developing and implementing a comprehensive project, which may include energy efficiency, renewable energy, distributed generation, cogeneration or combined heat and power, and/or water efficiency measures. An ESPC project is delivered by an ESCO, which will develop, implement, and help arrange financing for the project, and then will monitor the energy savings and often maintain the upgrades over many years (at the discretion of the customer). <http://www1.eere.energy.gov/wip/solutioncenter/financialproducts/espc.html>
- 3. **Existing Building Commissioning Toolkit:** Templates, sample documents, request for proposal (RFP) checklist. http://www.cacx.org/resources/rcxtools/templates_samples.html
- 4. **Commissioning Providers, including building types:**
http://www.cacx.org/resources/provider_list.html
- 5. **SMUD Contractors**
 - a. **HVAC:** https://www.smud.org/en/business/save-energy/energy-management-solutions/documents/hvac_list.pdf
 - b. **Lighting:** <https://www.smud.org/en/business/save-energy/rebates-incentives-financing/documents/CI-Lighting-Contractor-List.pdf>

Funding Resources

- 1. **California Energy Commission**
 - a. **Low Interest Loan Program:** This program provides low-interest loans to K–12 schools for energy efficiency projects. <http://www.energy.ca.gov/efficiency/financing/>
 - b. **Bright Schools Program:** Provides comprehensive energy audits to K–12 schools at no cost. For additional information call 1-916-654-4104. <http://www.energy.ca.gov/efficiency/brightschoools/index.html>
- 2. **Investor-Owned Utility Energy Efficiency Rebate Programs**
 - a. **New Construction—Savings by Design:** Statewide program offered by the Investor-Owned Utilities (IOUs) to help offset the cost of designing energy efficient buildings. Incentives offered to both building owners and design teams. <http://www.savingsbydesign.com/>

b. **PG&E**

- **Retro-commissioning (RCx):** A systematic process for identifying less-than-optimal performance in a facility's equipment, lighting, and control systems and making the necessary adjustments.
<http://www.pge.com/mybusiness/energysavingsrebates/rebatesincentives/retrocommissioning/>
- **School Energy Efficiency (SEE) Program:** Offers K–12 school districts energy services for project evaluation. <http://schoolenergyefficiency.com/>
- **Money-Back Solutions K–12:** Information to help school districts better manage energy costs.
<http://www.pge.com/mybusiness/energysavingsrebates/incentivesbyindustry/schoolsandcolleges/prekto12/>

c. **SCE**

- **Retro-commissioning:** <http://www.sce-rcx.com/>
- **Express Solutions:** Offers SCE business customers cash rebates to offset the cost of replacing or upgrading to high-efficiency equipment that can improve their facilities' energy efficiency. http://www.sce.com/business/ems/express_solutions.htm
- **Customized Solutions:** Offers financial incentives for the installation of new high-efficiency equipment or systems. Examples of projects include common retrofits like HVAC and refrigeration upgrades, or more specialized process improvements and customized equipment replacements.
<http://tinyurl.com/bwuqf76>

d. **SDG&E**

- **Retro-commissioning:** <http://www.sdge.com/rcx-retrocommissioning-program>
- **Energy Efficiency Business Rebates (EEBR):** Offers rebates to eligible business customers for installing energy-efficient lighting, refrigeration, food service, natural gas, and other technologies. <http://www.sdge.com/earn-rebates-your-improvements>
- **Energy Efficiency Business Incentives (EEBI):** Offers incentive payments for energy efficiency projects involving the installation of new, high-efficiency equipment or systems.
<http://www.sdge.com/save-energy-earn-incentives>

e. **SoCalGas**

- **Retro-commissioning:** <http://www.socalgas.com/for-your-business/energy-savings/rcx.shtml>
- **Rebates and Energy Efficiency:** A variety of energy efficiency programs and services designed to help businesses save money and energy. <http://www.socalgas.com/for-your-business/rebates/industry/schools/>

3. Investor-Owned Utility Financing Programs

- a. **On-Bill Financing:** Zero-interest financing for business customers.
 - **PG&E:**
<http://www.pge.com/mybusiness/energysavingsrebates/rebatesincentives/taxcredit/onbillfinancing/>
 - **SCE:** <http://www.sce.com/business/onbill/about-on-bill.htm>
 - **SDG&E: Investor-Owned Utility Demand Response Programs — Demand Response (DR)** is when electric utilities pay their customers to temporarily use less electricity at critical times of the day when electricity is more expensive. DR reduces the need to build power plants that will only be used a few hours a year during peak electricity times. Most utilities have DR programs that schools can participate in. In addition, private companies called Demand Response Aggregators will pay a school for reducing its electricity consumption when needed and sell these load reductions to the utilities. The easiest type of DR to participate in is an air conditioner cycling program, where the utility turns an air conditioning system off for short periods of time during DR “events.” Studies show that most participants do not notice that these events have occurred, so a school community is not likely to notice any reduced comfort level. <http://www.sdge.com/bill-financing>
- b. **PG&E Demand Response information:**
<http://www.pge.com/mybusiness/energysavingsrebates/demandresponse/>
- c. **SCE Demand Response information:** <http://tinyurl.com/ckmugbw>
- d. **SDG&E Demand Response information:** <http://www.sdge.com/save-money/demand-response/overview>

4. Los Angeles Department of Water and Power (LADWP) Rebate Programs

- a. **Retro-commissioning Express Program:** https://www.ladwp.com/ladwp/faces/ladwp/commercial/c-savemoney/c-sm-rebatesandprograms/retrocomm-exp-prog?_adf.ctrl-state=35p0elhk3_4&_afLoop=230261688511000
- b. **Commercial Lighting Efficiency Offer (CLEO):** Provides rebates to reduce electricity bills and the cost of new lighting equipment when retrofitting existing fixtures with state-of-the-art, energy-efficient lighting technologies. https://www.ladwp.com/ladwp/faces/wcnave_externalld/c-sm-lighting?_adf.ctrl-state=apweoggyp_4&_afLoop=730877354731000
- c. **Commercial Refrigeration Program:** Provides rebates to reduce electricity bills and the cost of new refrigeration equipment. (Sample measures include ice machines, solid and glass refrigerator doors, door gaskets, night covers, strip curtains, and vending machine controllers). https://www.ladwp.com/ladwp/faces/wcnave_externalld/c-sm-refrigation?_adf.ctrl-state=apweoggyp_4&_afLoop=731910089516000
- d. **Custom Express Program:** Offers rebates for specific measures to efficiently control energy use of networked computers, Energy Star–certified office equipment, and other plug loads. https://www.ladwp.com/ladwp/faces/wcnave_externalld/c-sm-cut-express?_adf.ctrl-state=apweoggyp_4&_afLoop=732046240530000
- e. **Custom Performance Program (CPP):** Offers incentives for the installation of energy saving measures, equipment or systems that exceed current Title 24 or minimum industry standards. https://www.ladwp.com/ladwp/faces/wcnave_externalld/c-sm-cust-perform-prog?_adf.ctrl-state=apweoggyp_4&_afLoop=731055776558000

5. **Sacramento Municipal Utility District (SMUD):** 1-877-622-SMUD (7683)

a. **Energy Management Control Systems**

- **Performance Incentive:** <https://www.smud.org/en/business/save-energy/energy-management-solutions/control-systems/performance-incentive.htm>

b. **Express Incentives:** Turnkey solutions to save energy and money on retrofits

- **Lighting:** <https://www.smud.org/en/business/save-energy/rebates-incentives-financing/lighting/express-incentives-lighting.htm>
- **HVAC:** <https://www.smud.org/en/business/save-energy/rebates-incentives-financing/incentives-for-heating-and-cooling/express-incentives-air-conditioning.htm>
- **Refrigeration:** <https://www.smud.org/en/business/save-energy/rebates-incentives-financing/refrigeration/express-incentives-refrigeration.htm>

c. **Prescriptive Incentives**

- **Lighting:** <https://www.smud.org/en/business/save-energy/rebates-incentives-financing/lighting/prescriptive-lighting-incentives.htm>

d. **Custom Incentives:** Financial incentives to make retrofits that improve the efficiency of systems.

- **Lighting and Controls:** <https://www.smud.org/en/business/save-energy/rebates-incentives-financing/lighting/customized-lighting-incentives.htm>
- **HVAC:** <https://www.smud.org/en/business/save-energy/rebates-incentives-financing/incentives-for-heating-and-cooling/customized-incentives-air-conditioning.htm>
- **Refrigeration:** <https://www.smud.org/en/business/save-energy/rebates-incentives-financing/refrigeration/customized-incentives-refrigeration.htm>

e. **Plug Loads Sensors and Equipment:** <https://www.smud.org/en/business/save-energy/rebates-incentives-financing/office-equipment.htm>

f. **New Construction — Savings by Design:** <https://www.smud.org/en/business/save-energy/rebates-incentives-financing/savings-by-design.htm>

g. **Loans:** \$10,000 to business customers who are investing in energy efficiency measures, with the consideration of higher loan amounts on a case-by-case basis.
<https://www.smud.org/en/business/save-energy/rebates-incentives-financing/business-improvement/smud-loans.htm>

6. **American Association of School Administrators (AASA) Toolkit: Cost-Effective Financing for School Construction and Renovation:** Helping school districts access tax-credit bonds to finance the construction and repair of public schools. <http://www.aasa.org/content.aspx?id=12676>

7. **Financing Energy Upgrades for K–12 School Districts, A Guide to Tapping into Funding for Energy Efficiency and Renewable Energy Improvements:** This guide focuses on clean energy financing options for school administrators, facility managers, and other K–12 school decision makers who are considering investments in high-performance school projects. The guide explicitly focuses on comprehensive energy upgrades, those that involve multiple measures and are targeted toward achieving significant energy savings and attempts to provide the foundation needed for successful projects. <http://emp.lbl.gov/sites/all/files/lbnl-6133e.pdf>

Funding Search Engines

1. **Energy Upgrade California (EUC):** Web site that offers information on energy-saving projects. In the coming months, the site will include links to participating contractors and energy efficiency rebates and incentives.
https://energyupgradeca.org/statewide_tour_page1
2. **Database of State Incentives for Renewables & Efficiency (DSIRE):** A comprehensive source of information on state, federal, local, and utility incentives for renewable energy and energy efficiency.
<http://www.dsireusa.org/>

Training and Education

Energy Training School Facility Manager

1. **Utility Training Centers:** Offers training that is relevant to facilities and energy managers. For example:
 - **PG&E:** <http://www.pge.com/mybusiness/edusafety/training/>
 - **Sacramento Municipal Utility District (SMUD):** <https://www.smud.org/en/business/education-safety/workshops-and-training/index.htm>
 - **SCE:** <http://www.sce.com/b-sb/energy-centers/ctac/ctac.htm?from=ctac-redirect>
2. **California Workforce Investment Board:** Oversees the local workforce investment boards, which can offer tailored training opportunities. <http://www.cwib.ca.gov/>
3. The **Division of the State Architect's Sustainable Schools:** Program offers numerous training resources. <http://www.sustainableschools.dgs.ca.gov/SustainableSchools/training/training.html>

Education — Connections to the Classroom

All facilities upgrades should connect with teachers and students to provide excellent “learning lab” opportunities—which, for example, could provide at-risk youths and career technical education (CTE) students with hands-on training, internship, and mentoring opportunities. Here are some examples of resources that connect energy efficiency to students, teachers, and parents:

- The **Los Angeles Unified School District** partnered with the “We Build” program (a 10-week, pre-apprenticeship construction training) and labor unions to provide hands-on opportunities for school facilities construction. <http://www.laschools.org/new-site/we-build/>
- The **City of Richmond** trains youths, ages eighteen to twenty-four, for construction, including energy efficiency and renewable energy, as important components of its RichmondBUILD program. <http://www.ci.richmond.ca.us/index.aspx?nid=1243>
- **Strategic Energy Innovations** runs energy efficiency awareness and education programs for communities, schools, and postsecondary institutions, as well as energy-related workforce training programs. <http://www.seiinc.org/>
- The **Alliance to Save Energy (ASE)** is a national energy education organization. ASE offers the PowerSave Schools Program, which educates students about energy efficiency and assessing school energy use. <http://ase.org/programs/powersave-schools>
- The **Energy Coalition** offers energy education programs, including PEAK Student Actions. <http://energycoalition.org/>

- The **California Center for Sustainable Energy** works with SCE to train teachers in sustainability practices and has run large scale consumer efficiency programs. <http://energycenter.org/>
- **PEAK** is an environmental education program, funded by the joint Investor-Owned Utilities, designed to empower students with the knowledge to manage energy use in their homes, schools, and communities. Through hands-on learning, students are inspired to take action to create a more sustainable world. <http://www.peakstudents.org/>
- The **Pacific Gas and Electric Company (PG&E) Energenius Educational Series** offers engaging and interactive programs for students in kindergarten through eighth grade. All the programs have been field tested and correlate to California's academic content standards. <http://www.pge.com/myhome/edusafety/teach/energenius/>
- The **Energy Efficiency Education Program** is administered by San Diego Gas & Electric Company (SDG&E) through a contract awarded to the San Diego County Office of Education. This program educates students, teachers, and parents about energy and energy efficiency to provide meaningful solutions to climate change by offering curricular resources based on California's science standards, professional development, and online support. http://k12e3.org/kids_home.php

Case Studies and Additional Resources

Non-Energy Benefits in Schools

- **Non-Energy Benefits: Status, Findings, Next Steps, and Implications for Low Income Program Analyses in California:** <http://www.liob.org/docs/LIEE%20Non-Energy%20Benefits%20Revised%20Report.pdf>
- **Daylighting in Schools, Reanalysis Report:** <http://www.energy.ca.gov/2003publications/CEC-500-2003-082/CEC-500-2003-082-A-03.PDF>
- **Greening America's Schools—Costs and Benefits:** <http://www.usgbc.org/Docs/Archive/General/Docs2908.pdf>
- **Non-Energy Benefits (NEBs) from Commissioning in Schools, Prisons, and Other Public Buildings:** http://www.eceee.org/conference_proceedings/ACEEE_buildings/2006/Panel_4/p4_12/paper
- **National Clearinghouse for Educational Facilities:** <http://www.ncef.org/>
- **LEED for Schools Rating System:** Recognizes the unique nature of the design and construction of K–12 schools. Based on the rating system, it addresses issues such as classroom acoustics, master planning, mold prevention, and environmental site assessment. <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1586>
- **Fresno Unified School District Sees the Light:** A case study of a school energy efficiency program. http://www.rsgrp.com/pdf/case_study_fusd.pdf
- **Butte Community College:** http://www.enovity.com/casestudies_butte.html
- **Prevailing Wage Codes:** Department of Industrial Relations. http://www.dir.ca.gov/OPRL/FAQ_PrevailingWage.html

ATTACHMENT A



CALIFORNIA DEPARTMENT OF EDUCATION SCHOOL FACILITIES AND TRANSPORTATION SERVICES DIVISION

CLEAN ENERGY JOBS ACT OF 2012 — PROPOSITION 39 EXPENDITURE REPORT: 2013–14

COUNTY, DISTRICT, AND SCHOOL INFORMATION				
County	County	District Code	School Code (if Charter School)	
County Office of Education/District Name/Charter School Name				
<input type="checkbox"/> By checking this box the local educational agency is declaring that all cost-effective energy efficiency projects have been installed or that it has committed installation contracts and may consider alternative energy generation or innovative energy projects.				
CONTACT INFORMATION				
Contact Person		Title		
Telephone Number	Fax Number	E-mail Address		
Total Amount Received		\$		
PROJECTS				
	District-wide or School Name	Jobs Created/Title	Total Project Cost	Estimated Cost Benefit
Energy Efficiency				
Clean Energy Installations				
Related Improvements & Repairs				
Health & Safety				
Non-Energy Benefits (NEBs)				
Other				
CERTIFICATION				

I certify under penalty of perjury that to the best of my knowledge, the information in this report is true and correct. The Governing Board of the above-named LEA has authorized me to sign this report on its behalf.

Signature of LEA Superintendent, Designee, or
Charter School's Chief Administrative Officer

Title

Date

ATTACHMENT A

CLEAN ENERGY JOBS ACT OF 2012 — PROPOSITION 39 EXPENDITURE REPORT: 2013–14

Technical Assistance

For help in completing this application, please contact _____ in the School Facilities and Transportation Services Division at 916-XXX-XXXX or by e-mail at XXXXXX@cde.ca.gov.

Submission Information

Please submit one signed original expenditure report. Facsimiles will not be accepted. Reports must be received by October 1, 2014.

Mail to:

Clean Energy Jobs Act of 2012 — Proposition 39
Expenditure Report: 2013–14
School Facilities and Transportation Services Division
California Department of Education
1430 N Street, Suite 1201
Sacramento, CA 95814

County, District, and School Information

Please provide the name of the county where the county office of education, school district, or charter school is located; the county code, district code, and school code (if a charter school); and the name of the county office of education, school district, or charter school.

Contact Information

In the spaces provided enter the name and title of the contact person who is to be contacted by the California Department of Education for any questions related to this report, and the contact person's telephone number and extension, fax number, and e-mail address.

Total Amount Received

Enter the total amount received from the State Superintendent of Public Instruction.

Projects

Enter the type of project under each category provided. Attach additional sheets if necessary.

- State whether the project was district-wide or provide the name of the school site where the project was completed.
- Enter the number of jobs created, and the job title.
- Enter the total project cost.
- Enter the estimated cost benefit.

Please provide documentation on project specifications, costs, and projected energy savings upon submittal.

Certification

The LEA's superintendent, designee, or charter school's chief administrative officer, as authorized by the local governing board, must sign this page in order to certify that the information contained in the report is true and correct.

Endnotes

- ⁱ The Center for the Next Generation, [*Proposition 39: Investing in California's Future*](#), white paper, December 11, 2012.
- ⁱⁱ Exempted products must comply with all currently effective design, construction, and inspection provisions contained in Title 24 as adopted by DSA-SS. Refer to DSA IR A-10, Section 3.
- ⁱⁱⁱ **11B-202.4 Path of Travel Requirements in Alterations, Additions and Structural Repairs.**
When alterations or additions are made to existing buildings . . .
Exceptions:
7. Projects consisting only of heating, ventilation, air conditioning, reroofing, electrical work not involving placement of switches and receptacles, cosmetic work that does not affect items regulated by this code, such as painting, equipment not considered to be a part of the architecture of the building or area, such as computer terminals and office equipment shall not be required to comply with 11B-202.4 unless they affect the usability of the building or facility.
- ^{iv} **ALTERATION [DSA-AC]** A change, addition or modification in construction, change in occupancy or use, or structural repair to an existing building or facility. Alterations include, but are not limited to, remodeling, renovation, rehabilitation, reconstruction, historic restoration, resurfacing of circulation paths or vehicular ways, changes or rearrangement of the structural parts or elements, and changes or rearrangement in the plan configuration of walls and full-height partitions. **Normal maintenance, reroofing, painting or wallpapering, or changes to mechanical and electrical systems are not alterations unless they affect the usability of the building or facility.**
- ^v Replacement of glazing units is considered normal maintenance of the glazing system that does not affect the “usability of the building” and therefore would not qualify as alterations under 11B-202.4.
- ^{vi} Replacement of screens is considered normal maintenance of a glazing sub-system that does not affect the “usability of the building” and therefore would not qualify as alterations under 11B-202.4.
- ^{vii} The addition of fixed and operable solar shading devices, such as horizontal sun shades or vertical fins that require structural connections to the building or ground, is a **“A change, addition or modification in construction”** and would qualify as alterations under 11B-202.4.
- ^{viii} The addition of an Energy Management System would be a **“change to an electrical or mechanical system”** and not considered an alteration for purposes of accessibility under 11B-202.4. See note iv above.
- ^{ix} Lighting Upgrades—re-lamping, ballast replacements, fixture replacement—are **“electrical work not involving placement of switches and receptacles.”** See note iii above. By definition, these upgrades are also **“changes to mechanical and electrical systems”** that would not qualify as alterations for purposes of accessibility upgrades under 11B-202.4.
- ^x Upgrades to water heating systems are considered **“changes to mechanical and electrical systems”** and not alterations for purposes of accessibility upgrades. See note v above.
- ^{xi} The addition of skylights or solar tubes in the roof of an existing building would be **“A change, addition or modification in construction”** and qualifies as an Alteration. See note v above.